

Standard
for
GDOT Hot Mix Asphalt Technician Training and Qualification Program

Developed from AASHTO DESIGNATION: R 25-00

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Revision Sheet

| October 19, 2001: Revised to add specific requirements for QCT Level II Manager.
Pages 7-9, 11-14 modified. [Added a new Section 9.1 and Figure 2, renumbered Section 9.]

1. SCOPE AND LIMITATION

1.1 This document communicates the evaluation and qualification procedures for personnel engaged in sampling and testing of hot-mix asphalt(HMA) for the Georgia Department of Transportation (GDOT).

1.2 The terms QCT Level I and QCT Level II identify a Quality Control Technician (QCT) at Level I and Level II.

1.3 This guideline does not purport to address all possible events and procedures inherent in the administration and use of a Technician Qualification Program (TQP).

2. REFERENCE DOCUMENTS

2.1 "Guidelines for Establishing Technician Training and Certification Program" National Quality Initiative Steering Committee, September 1997.

2.2 "Quality Control/Quality Assurance - Technician Training and Certification/Qualification," June 1997, National Task Group for Technician Training and Certification, sponsored by FHWA.

2.3 *Implementation Manual for Quality Assurance*, AASHTO

2.4 *Quality Assurance Guide Specification*, AASHTO

2.5 *Georgia DOT Sampling, Testing and Inspection Manual (STI)*.

2.6 *QCT Level I Reference Guide and Study Guide*, GDOT, May 2000

3. INTRODUCTION

3.1 This guideline is provided to:

- (a) Describe the adopted procedures for the GDOT hot mix asphalt TQP.
- (b) Describe the activities and organizational needs for the operation of a technician qualification program that provides a flexible and effective means for ensuring qualified personnel perform sampling and testing.
- (c) Describe coverage for QCT Levels I & II tests, the basic tests performed to identify material or product characteristics, for acceptance and/or payment under project contracts incorporating hot-mix asphalt. The basic tests that are included under Levels I & II are shown in Appendix A.
- (d) QCT Level III is not currently covered by this guideline but is considered to address the function of mix design and is available through the National Center for Asphalt Technology (NCAT), Auburn, Alabama.

A successful TQP requires the full support and commitment from agencies and industry that have a vested interest in technician training and qualification. Involvement of all those with a common interest in technician training and qualification helps in understanding the multiple perspectives of the team members, and this in turn helps develop policies and procedures that will be supported by their respective organizations.

Consideration of reciprocal agreements between states, and where feasible regions, regarding materials technician qualification acceptance will be addressed as the Regional program is developed. GDOT is currently a member of the Southeast Task Force for Technician Training and Qualification (SETFTTQ).

3.2 Background:

Historic roles and responsibilities of industry and agencies have changed for sampling and testing activities under QA specifications. GDOT QA specifications allow the use of contractor test results in making acceptance decisions for materials and construction quality control in hot mix asphalt construction.

Qualification programs and associated training have been shown to be an effective tool for improving the quality of construction by verifying that essential knowledge and skills are possessed by agency or industry personnel who monitor, inspect, and control construction operations. Qualification programs for personnel have proven to be useful, common "yardsticks" for measuring expertise and performance among public transportation agencies, private construction contractors, and independent materials laboratories.

The need for TQPs as an equitable means for test result comparison and credibility between contract parties has become apparent. Provisions requiring the use of qualified technicians involved in construction project testing and inspection activities are included in GDOT's QC/QA specifications for hot mix asphalt.

4. PROGRAM ORGANIZATIONAL STRUCTURE AND MANAGEMENT

4.1 Joint Sponsorship. Key to Success -- A successful TQP works best with the full support and commitment from all parties (agency and industry) that have a vested interest in technician training and qualification. The endorsement of this document provides the basis for a partnership agreement of the HMA TQP between GDOT and industry.

4.2 HMA TQP Oversight Committee -- Members from the GDOT/GHCA Asphalt Technical Committee shall serve as the HMA TQP Oversight Committee. The HMA TQP Oversight Committee shall be composed of 3 Contractor members, 3 GDOT members, 1 Consultant and 1 FHWA representative. The TQP Manager will chair the HMA TQP Oversight Committee. Program oversight should be a joint effort of all the entities represented on the Oversight Committee.

4.3 TQP Manager-- The TQP Manager will be the GDOT State Materials and Research Engineer. The TQP Manager or their designee will coordinate the activities of the HMA TQP Oversight Committee.

4.4 Location - All correspondence related to the HMA TQP should be directed to the State Materials and Research Engineer, 15 Kennedy Drive, Forest Park, Georgia 30297.

4.5 Funding - Course fees, when necessary, will be reasonable but adequate to enable the program to become self-sufficient. Areas where operational support may be available include the following:

- (a) Continued financial support from the agency and industry;
- (b) Continued use of contributed facilities, equipment, etc, from the agency and industry.

4.6 Organizational Task Groups -- Task groups will be established and used to develop programs, plans, and policies for presentation and approval from the Oversight Committee as needed.

5. TRAINING AND QUALIFICATION POLICIES

5.1 In developing GDOT's TQPs, the following guiding principles will be followed:

5.1.1 Focus - In order to support the overall objective of improving the quality of the construction of highways through the improved work performance of those involved with the construction project, the TQP *must be directly work related*. The scope and content of all qualification testing must be based on realistic and practical work needs. Because the TQP focuses on work performance, everyone involved - managers, supervisors, program administrators, and participants- should treat qualification activities as natural extensions of their work duties and responsibilities.

5.1.2 Leveraging and Aligning Activities and Programs Between States and Regions - GDOT is a member of SETFTTQ and whenever possible, consideration will be given to developing state technician qualification requirements in tandem with SETFTTQ. Participation in a regional program has the positive benefit of pooling and leveraging state resources and also of allowing qualified technicians to work across state boundaries without having to retrain and requalify. Gaining these benefits will lower the states' and contractors' cost of doing business while still ensuring that high-quality testing is performed.

GDOT will develop a written policy regarding reciprocity based on the work of SETFTTQ.

5.1.3 Consideration of Prerequisites - In addition to any required training, work experience may be used as an integral part of the qualification process to ensure technicians have the required knowledge, skills, and abilities. This assurance may be accomplished by establishing pre-qualification relevant work experience or education requirements, establishing work experience criteria pre-requisites for participation in advanced qualification levels, or requiring relevant work experience to maintain and validate the requalification process.

6. TRAINING

6.1 A well-planned and supportive training program is needed for a successful qualification program. A good training program will ensure qualified technicians will be performing inspection on construction projects.

6.1.1 TEMPORARY CERTIFICATION: Temporary certification may be granted to a technician trainee who is given direct oversight by a certified Level I or II QCT while performing acceptance testing duties during the first 5 days of training. The trainee must complete certification requirements for Level I within 30 production days after being granted temporary certification. A trainee who does not become qualified within 30 production days will not be re-eligible for temporary certification.

6.1.2 LEVEL I: Level I training will be accomplished by on-the-job training supplemented by GDOT Engineering Skills Development Workbooks and the *QCT Level I Reference Guide and Study Guide*. ESD self-study texts are available on the GDOT website at:

http://www.dot.state.ga.us/homeoffs/training/training_ext/schedule.html

6.1.3 LEVEL II: A training/review class is currently provided by the GDOT for Level II certification.

6.1.4 Development and maintenance of future training programs will be determined by the TQP Oversight Committee. Training materials may be developed solely for the TQP or developed with another state/region. Program administration will identify the following:

- (a) Funding and fees;
- (b) Staffing (instructors, coordinators, proctors, etc.);
- (c) Training facilities;
- (d) Materials (manuals and equipment);
- (e) Record keeping;
- (f) Governing Board/Advisory Committee; and
- (g) Organizational Task Groups.

6.1.5 Qualified technicians will need to be kept aware of specification, equipment, or administration changes in the training program. This need will be satisfied by requalification training, update courses, or special training efforts conducted by GDOT in conjunction with industry partners. Future training programs will be offered to individuals who are responsibly involved in QC/QA testing as well as those involved in the acceptance decision process including those from GDOT, local agencies, contractors, producers, or consultants. The program will be administered the same for all individuals.

7. EXAMINATION AND METHODS

7.1 A successful qualification program must have documented policies and procedures for examination methods to ensure consistent and fair administration by all examiners and proctors.

The TQP manager or their designee shall direct and coordinate all qualification examination activities. This includes scheduling of examinations; registration of applicants; maintaining and ensuring of security of examination materials; notifying

participants of their success or failure in their examination; and maintaining all completed examination materials.

Written and performance examinations will be given to determine if the applicants possess the knowledge and skills necessary to satisfy the established qualification requirements.

7.2 Examination Controls and Integrity – To avoid conflicts of interest, the examiner should not be the immediate supervisor of those being qualified. Examination procedures are as follows:

(a) GDOT will be responsible for the development of and revision of qualification exams including updating or changing exams when there is a change in a test method or specification. GDOT currently administers the Level I and Level II QCT exams. Available dates and times for exams can be requested through the TQP Manager or the District Laboratory Supervisors.

(b) Applicants will be allowed no more than 4 hours for the Level I written examination and no more than 6 hours for the Level II written examination.

(c) Cheating on an exam will result in permanent revocation of any QCT Certification and the inability to apply for any QCT certification in the future.

(d) Examinations for Level I will be proctored at the District Labs or the Central Lab and examinations for Level II will be proctored at the Central Lab. A proctor will be present in the room at all times while administering the test.

(e) Examinations will be given on an as-needed basis, but no less than twice a year.

(g) Applicant must pass field portion of exam before taking the written portion of exam. Passing the field portion is considered to be a grade of 80 or higher. Passing the written portion is considered to be a grade of 80 or higher. If applicant passes field portion but fails written section, applicant is required to retake the written portion only (if the retest is done within 60 days of first exam).

(h) Individuals will be notified of examination results by mail.

7.3 Examination Methods – Written and performance examinations should be given to ensure that applicants have a complete understanding of the materials and calculations as well as the ability to perform test procedures. Care and good judgment are needed in developing fair and impartial written and performance examinations.

Prior to the examinations, the proctors should thoroughly explain to the applicants the examination process and rules noted in 7.2 above including:

- (a) Time limits
- (b) What the exams will be comprised of
- (c) Minimum score necessary to pass
- (d) Penalty for cheating; and
- (c) The retesting policy.

7.3.1 Written Examination – The written examination will be open-book and will have a designated time limit. Examinations may consist of various types of questions, including true/false, multiple choice, essay, fill-in-the-blank, word problems, and calculations. To protect examination integrity, course participants

cannot retain a copy of their completed written examinations. The TQP will maintain several equivalent versions of the test and alternately present different versions to examinees.

7.3.2 Performance Examination – Performance examinations measure the applicants’ ability to properly perform the prescribed test methodology. All proctors and examiners should evaluate each applicant’s proficiency by using standardized checklists that identify specific test method steps or tasks. The degree of detail of the performance checklists will be influenced by whether the performance examination is open- or closed-book. Inspection checklists are in Appendix B. Time limits will be set for the complete performance of each test method. The examinee may be asked to explain various steps of the procedure to reduce the full test time.

7.4 Re-Examination Policy-Written/Performance – Whenever a participant fails a written/performance qualification examination, an allowance will be provided for retesting. The policy is as follows:

- After first failed exam-QCT must wait 30 days before retaking Level I or Level II exam.
- After second failed exam- QCT must wait 90 days before retaking Level I or Level II exam
- After third failed exam-QCT must wait 12 months before retaking Level I or Level II exam.

The number of retests allowed and the time limits are needed to avoid frivolous, trial-and-error attempts and encourage the participants to properly prepare for testing.

7.5 Notification of Results – Notification of an applicant’s successful or unsuccessful completion of the qualification requirements will be mailed to the applicant promptly after completion of the examination. If the applicant is unsuccessful, the procedure for re-examination will be explained in the letter.

7.6 Confidentiality of Records – Personal information and records of the examination are generally considered to be confidential and not to be released publicly. Confidential information includes:

- (a) Personal and professional information provided by the participants applying for testing and qualification; and
- (b) Specific test results and scores for participants.

7.7 Examination Materials Security – Proctors are to maintain the security of exam materials at all times. No copying of portions of the exam is acceptable. After the performance test, examiners and proctors may inform the applicants of their weaknesses and the details of correct procedures.

7.8 Examiner and Proctor Qualifications –Examiners for the performance examination must be qualified in that examination area. Examiners will be Testing Management Operations Supervisors, Bituminous Technical Services Engineers, or others deemed appropriate by the TQP Manager.

7.9 Examination Appeals – An applicant wishing to register a complaint or protest regarding an examination or examiner must do so in writing to the TQP Manager within 14 days of the incident. The written complaint must specify the examination date, the examiner, and the nature of the complaint or protest.

Complaints and protests should be reviewed and a recommendation made to the Chairman of the Appeal Board. All complaints and protests will be promptly answered in writing.

8. QUALIFICATION

8.1 This document serves as the written policy for administration of the GDOT HMA TQP. Each Qualifying Agency that issues through their TQP the status of qualification or certification must maintain a written policy for administration of their TQP.

8.2 GDOT will maintain a registry of trained technicians who have successfully completed a training program. The registry will include:

- (a) Name, Social Security number or qualification identification number and address;
- (b) Courses, and dates completed;
- (c) Course content:
 - Test methods included;
 - Lecture or laboratory;
 - Written examination; and
 - Performance examination.

8.3 GDOT shall provide the qualified technician with documentation of the qualification in the form of a registration card and certificate. The document will include an expiration date.

The Qualifying Agency requires the registered technician to maintain a current address on file as a condition of registration. Send change of address notice to: TQP Manager, Georgia Department of Transportation, 15 Kennedy Drive, Forest Park, GA 30297.

8.4 Recertification for Levels I and II will be required 3 years after initial certification. The re-qualification process may include refresher courses, observations, and/or re-testing.

9. CONFLICT RESOLUTION

9.1 QCT Manager Responsibilities: Each HMA plant on the Departments Qualified Products List (QPL) must designate a Level 2 QCT as manager of the quality control operations within the Contractors operations. The QCT Manager shall be accountable for

actions of other Level 1 and Level 2 QCT personnel. QCT Managers will be notified of instances of incorrect procedures or falsification of records for QCT Level 1 or 2 employees as noted in Sections 9.2 - 9.5. QCT Managers that are following incorrect procedures or that continually have employees that require conflict resolution will be communicated to verbally and in writing following the Conflict Resolution Diagram shown in Figure 2. Continued discrepancies of the QCT Manager or QCT Level 1 or 2 employees under that Managers control will result in progressive actions including removing a HMA plant from the DOT approved list(QPL) until such time as another QCT Manager is named.

9.2 Incorrect Procedures- QCTs will be made aware of incorrect sampling and testing methods or failure to comply with QCT responsibilities at the time the incorrect procedure is identified. The QCT Level II Manager will be made aware of these discrepancies at the same time. The QCT will be instructed on how to correct discrepancies. (See Figure 1 for description of process) QCT Managers will be made aware of discrepancies in their own procedures or in the QCT's under their control. The HMA producer will also be notified if continued discrepancies occur with QCT Managers as shown in Figure 2.

9.3 Discussion meeting - If the QCT continues to fail in performing the duties as required, a meeting will be held at the District Lab in the District where the discrepancies occurred. The QCT and the QCT Manager will be invited to discuss the discrepancies in an attempt to alleviate the problem or communicate the correct procedure. The meeting will be formally documented and possible future disciplinary action will be noted in the follow-up letter.

9.4 Progressive Actions- If further problems are encountered:

- A. The QCT will be required to re-take the performance and/or written certification exam (at their existing Level) for failing to demonstrate the abilities of a Level I or Level II QCT.
- B. Certification may be suspended for a period of time.

9.5 Intentional Falsification of Records: Falsification of records or acceptance test results will result in permanent revocation of QCT Certification. A certified letter will be sent to the QCT, the QCT Manager, and the Corporate Head of the company that employs the QCT providing notification of permanent revocation and the appeal process.

9.6 Appeal Process- The QCT (or QCT Manager) will have the right to appeal any adverse action which results in suspension or permanent revocation of certification by responding to an Appeal Board within 10 calendar days after receiving notice of the proposed adverse action. Failure to appeal within 10 calendar days will result in the proposed adverse action becoming effective on the date specified in the notice. Failure to appeal within the time specified will result in a waiver of all future appeal rights regarding the adverse action taken. The QCT may appeal in writing or in person to the Chairman of the Appeal Board at: Director of Construction, Georgia Department of Transportation, Room 134, No. 2 Capitol Square, Atlanta, GA 30334. The Director of

Construction may be reached by phone at 404-656-5207 between the hours of 8 a.m. and 4 p.m. (Monday through Friday) in order to schedule an appointment. The QCT may continue working during the appeal process. An Appeal Board meeting will be called as needed by the Chairman of the Appeal Board. There will be five members on the Appeal Board, called by the Chairman:

An Appeal Board meeting will be scheduled as needed by the Chairman of the Appeal Board within 10 days of receiving the appeal notice. There will be five members on the Appeal Board, called by the Chairman:

- GDOT Division Director of Construction-(Chairman of the Appeal Board)
- GDOT Construction Liaison (not from affected District)
- Consultant (nominated by the Consultant community)
- Contractor (other than the QCT's company- nominated by the Contracting Industry)
- FHWA Resource Center Material Engineer or designee

The Appeal Board will hear the appeal and make a decision within 5 days of hearing the appeal. Decisions of the Appeal Board shall be final and shall be made in writing to the QCT.

CONFLICT RESOLUTION DIAGRAM – QCT Level 1 and 2

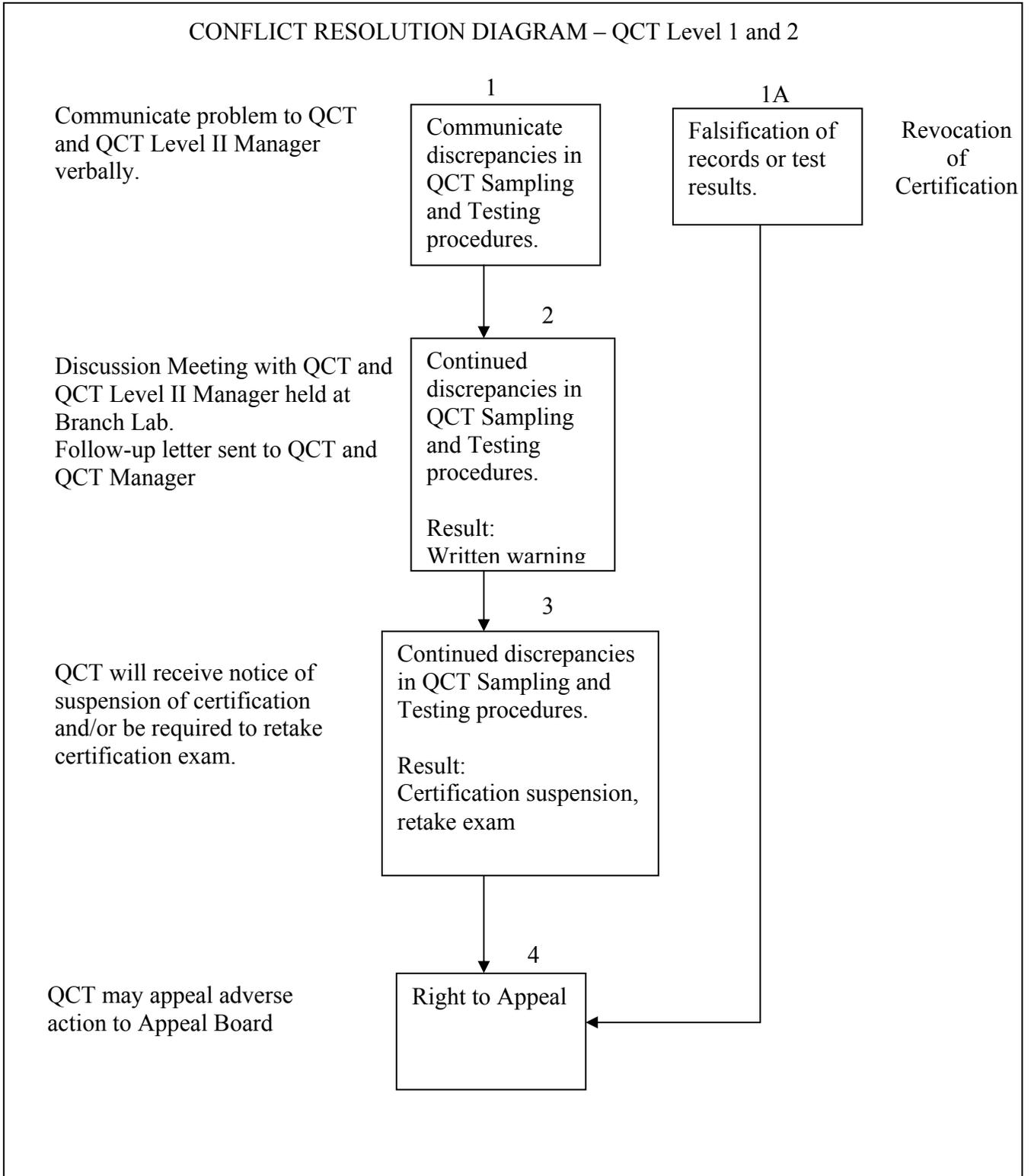


Figure 1

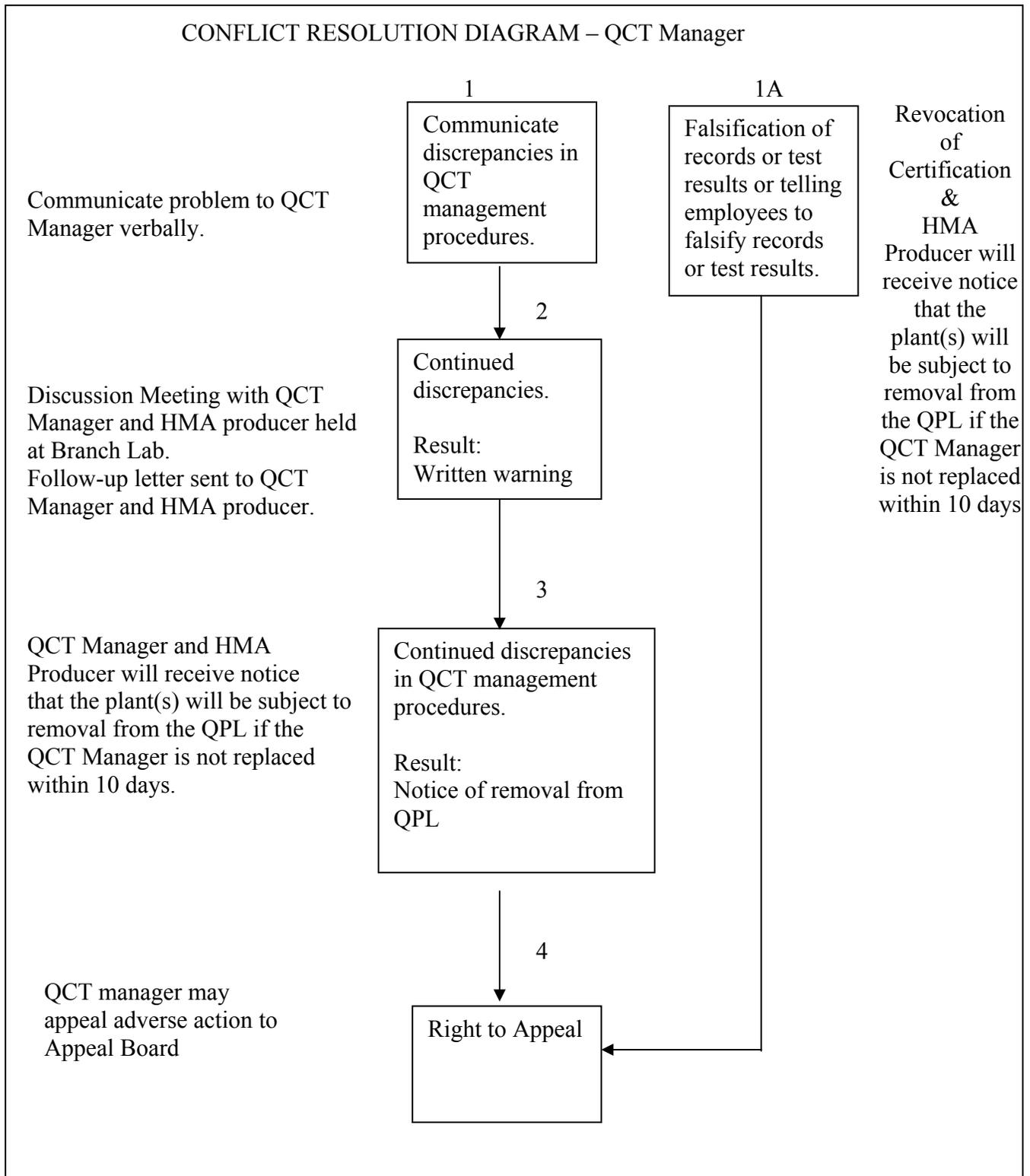


Figure 2

APPENDIX A – *Qualifying Tests*

OCT LEVEL I

Recommended AASHTO or Other Test Designation:

A.1.1 *Aggregate Gradation*

AASHTO T 27 – Sieve Analysis of Fine and Coarse Aggregates

A1.2 *Asphalt Content*

AASHTO T 164 – Quantitative Extraction of Bitumen from Bituminous Paving Mixtures

AASHTO T 308-99 and GDT-125 – Determining the Asphalt Binder Content of Hot-Mix Asphalt (HMA) by the Ignition Method

A.1.3 *Percent Passing 75- μ m (No. 200) Sieve*

AASHTO T 11 – Materials Finer than the 75- μ m (No. 200) Sieve in Mineral Aggregates by Washing

A.1.4 *Sampling Methods and Techniques*

ASTM D 140- Standard Practice for Sampling Bituminous Materials

ASTM D 979-96 – Standard Practice for Sampling Bituminous Paving Mixtures

GDOT GSP 21 – Sampling Procedures for Contractor Acceptance Testing

GDOT GDT 73 – Method of Random Selection and Acceptance Testing of Asphaltic Concrete

GDOT GDT 107 – Method for Determination of Asphalt Plant and Compaction Rating of Contractors

A.1.5 *Stripping*

AASHTO T 182-84 – Coating and Stripping of Bitumen-Aggregate Mixtures

A.1.6 *Field Verification*

AASHTO TP 4 – Method for Preparing and Determining the Density of Hot Mix Asphalt (HMA) Specimens by Means of the Superpave Gyrotory Compactor

AASHTO T 209 – Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures

OCT LEVEL II

Same as for Level 1, but must be able to make plant adjustments to correct mixture problems

APPENDIX B – *Inspection Checklists*

- **Can technician perform method-B and C as outlined in GDT-73?**
- **Can technician perform a thermometer calibration?**
- **Does technician know the frequency for calibrating a thermometer as specified in GSP-21?**
- **Can technician sample as prescribed in GSP-15, GSP-21 and Section 400?**
- **Is sample size checked for minimum requirements as outlined in GDT-83 or GDT-125?**
- **Can technician perform test methods GDT- 38, 83 and 125?**
- **Does technician generate reports and upload test results to DOT Computer system?**
- **Does technician plot average deviation of test results on mix flow chart?**
- **Does technician make all the daily entries into the plant diary as specified in GSP-21?**
- **Can technician perform an actual daily lime check and master lime check according to posted procedures?**
- **Can technician explain how to do an interlock system check according to plant posted procedures?**
- **Can technician explain GDT-56 (Test Method for Heat Stable Anti-Strip Additive) if they were producing OGFC or PEM mixes?**
- **Does technician know what inspection duties are required for a weekly plant check?**
- **Does technician know procedures for mixtures that contain RAP?**
- **Can technician obtain a liquid AC sample and fill out sample card properly?**
- **Does technician know what documents should be posted at an asphalt plant and are they posted?**